

PD-AAZ-835
~~2-17~~ 62:19

TROPICAL FORESTS/BIOLOGICAL DIVERSITY

ANNEX TO USAID/BELIZE FY 89-90 ACTION PLAN

March 1988

TABLE OF CONTENTS

I.	<u>Background</u>	.....1
II.	<u>Summary of Needs</u>	.....1
III.	<u>Analysis</u>	.....2
A.	<u>Tropical Forests</u>	.....2
1.	<u>Belize Forests</u>	.....2
a.	<u>Forests in the Economy</u>	.....2
b.	<u>The Forest Resource</u>	.....6
c.	<u>Forest Ownership and Institutions</u>	.....7
d.	<u>Management of Belize Forests</u>	.....8
i.	<u>Forest Reserves</u>	.....8
ii.	<u>Other Forests on Crown Land</u>	.....10
iii.	<u>Private Forests</u>	.....11
2.	<u>Tropical Forest Conservation Needs for Belize</u>	.....12
3.	<u>AID Participation</u>	.....14
B.	<u>Biological Diversity</u>	.....16
1.	<u>Biological Diversity in Belize</u>	.....16
2.	<u>Current Conservation Programs</u>	.....17
a.	<u>Laws, Authorities and Treaties</u>	.....17
b.	<u>Habitat Conservation Programs</u>	.....17
i.	<u>Public Lands</u>	.....17
ii.	<u>Protected Areas</u>	.....18
iii.	<u>Habitat Classification System</u>	.....18
iv.	<u>Habitat Conservation Needs</u>	.....19
c.	<u>Wildlife and Fisheries Programs</u>	.....20
i.	<u>Protected/Endangered Species</u>	.....20
ii.	<u>Hunting, Commercial Trade and Fisheries</u>	.....21
iii.	<u>Wildlife and Fisheries Program Needs</u>	.....22
d.	<u>Conservation Information Base</u>	.....22
i.	<u>Overview Documents</u>	.....22
ii.	<u>Literature</u>	.....23
iii.	<u>Institutions</u>	.....23
e.	<u>Private Sector Programs</u>	.....23
3.	<u>Economic Potential of Wildlands and Wildlife</u>	.....24
4.	<u>Biological Diversity Conservation Needs</u>	.....25
5.	<u>AID Participation</u>	.....26

DRAFT

TROPICAL FORESTS/BIOLOGICAL DIVERSITY
ANNEX TO USAID/BELIZE FY88/89 ACTION PLAN

1. Background

Title III of the Special Foreign Assistance Act of 1986, Public Law 99-529, amends the Foreign Assistance Act, requiring USAID missions to analyze in each country development strategy statement or other country plan (including action plans) (1) the actions necessary in that country to achieve conservation and sustainable management of tropical forests (sec. 301); (2) the actions necessary in that country to conserve biological diversity (sec. 302), and (3) the extent to which the actions proposed for support by the mission meet the needs thus identified. Information about these new requirements was first sent to missions in State 037076, with additional guidance in State 118324 and State 150862.

This annex addresses these new mission reporting requirements. The preparation of this draft has followed the plan of action proposed in State 230480. This called for AID/W assistance, through the services of ST/FENR Advisor on Biological Diversity and the Regional Forestry Advisor/Caribbean, USDA Forest Service.

This annex contains analyses of the current tropical forest management and biological diversity conservation situations in Belize. These analyses are intended for use in identifying needs and assessing priorities for future forest management and conservation actions by the Government of Belize (GOB), USAID, other international development assistance agencies and the private conservation community.

II. Summary of Needs

A. Tropical Forests

1. The contribution of Belize forests to the national economy needs to be increased.
2. A comprehensive National Forestry Development Plan should be developed by the GOB.
3. Management plans for established Forest Reserves need to be developed and implemented.

4. Representative areas of all natural forest types in Belize need to be protected, in order to assure the conservation of biological diversity.
5. Management of private sector forests needs to be promoted and increased.
6. Agroforestry and other technologies to sustain production on milpa farms is needed.

B. Biological Diversity

1. A public lands and land development policy needs to be established that includes consideration of the conservation of biological diversity.
2. A systems review of protected areas and the biological diversity of Belize is needed to determine areas for conservation management.
3. A land use/natural resources planning unit is needed within the Forest Department to develop management plans for forest reserves and conservation areas.
4. A wildlife biologist and a protected area specialist should be added to the Forest Department staff to implement existing authorities.
5. A fisheries regulations enforcement unit needs to be established in the Fishery Department.
6. An assessment of the development potential for natural history and cultural tourism to Belize's protected areas should be undertaken.

III. Analysis

A. Tropical Forests

1. Belize Forests

a. Forests in the Economy

Ninety-three percent (21,322 km²) of the land area of Belize is nominally classified as forest. This resource provided the basis for economic development in the country from the late 1700's until the 1950's. At the beginning of this period, the total economy of Belize was based on the export of logwood (Haematoxylum campecheanum) to Europe; in the early 1800's mahogany (Swietenia

macrophylla) exports displaced those of logwood. The contribution to the economy of timber exports, which provided about 75% of export income in the 1950's, has since diminished to about 1%, due to neglect of the forest sector, and promotion of other sectors, by the government.

During much of the period when the Belize economy was dominated by timber exports, colonial policy prohibited agriculture in the country. This policy was implemented in favor of the London-based trading companies, to ensure a market in the colony for their products. An additional effect of this policy was that labor was not drawn away from Crown-conferred timber concessions. Development of sugar plantations, and an increase in other agriculture as the policy prohibiting it was relaxed, have provided a substitute for timber production in the national economy.

During the 1800's, title to large areas of forest was accumulated by a few large companies for the extraction of mahogany, mostly in the northern part of the country. Since mahogany grows dispersed through the forest, large areas were not cleared of trees. Instead, tree hunters located trees during the rainy season, which were felled and skimed out to roads or waterways for transport to Belize City during the dry season. In the mid-1800's, a depression in mahogany exportation, apparently due to depletion of adequate-sized accessible trees, caused many landholders to sell out. Belize Estates and Produce Company, Ltd, a consortium of London and Belizean businessmen, bought up many of these holdings, eventually accumulating over 1,000,000 acres of forest area. Other areas reverted to the colonial government, which, during the 1920-30's, set up a system of forest reserves from these and other Crown lands, and a Forest Department to manage them. The Forest Department let out concessions in these reserves, enforcing a girth limit, below which trees could not be harvested. A release for each mahogany or cedar (Cedrela odorata) was required before trees could be cut. The reason for the girth limit, which varied by species, was to ensure that a reserve of marketable species of reproductive age was left to repopulate the forest. This measure was in response to the previous overcutting of the forest resource, and resulting scarcity of marketable trees, in the 1800 and 1900's. Royalties, which also varied by species, were charged to concessionaires. Eventually, the girth limit regulation and collection of royalties were extended to private lands, as well as the required release by forest guards for mahogany and cedar. Until self-government started in 1957, royalties collected for timber went to the Forest Department, which developed a cadre of trained professionals under a series of Forest Conservators. Since 1957, timber revenues have gone into the General Treasury, and Forest Department funds have come from ever more austere National budgets.

The primary species for export were, and continue to be, mahogany

and cedar, with small volumes of rosewood (Dalbergia stevensonii) and ziricote (Cordia dodecandra). Other species were cut for local construction and specialty uses, such as railway sleepers, dugout canoes, furniture, wagons, docks, tool handles, etc. These species include bull hoof (Drypetes brownii), bullet tree (Bucida buceras), black cabbage bark (Lonchocarpus castilloi), cypress (Podocarpus guatemalensis), mayflower (Tabebuia pentaphylla), mylady (Aspidosperma megalocarpum), nargusta (Terminalia amazonia), pine (Pinus caribaea var. hondurensis and P. oocarpa), prickly yellow (Zanthoxylum spp.), Santa Maria (Calophyllum brasiliense), sapodilla (Manilkara zapota), tubroos (Enterolobium cyclocarpum), waika chewstick (Symphonia globulifera) and yemeri (Vochysia hondurensis). Resin from chicle macho (Manilkara chicle) and sapodilla was harvested and exported for the manufacture of chewing gum.

Timber was traditionally exported as logs, and local forest industry was slow to develop beyond the modest needs of local consumption. Approximately 50 sawmills now exist in the country, most of which are old, small-scale, inefficient circular mills. Recently, a more efficient mill has been installed, with a 20 mbf (thousand board feet) per day capacity. A number of portable sawmills and manual pit saws also produce lumber. A limited amount of mahogany and other timbers are now exported as lumber, often in cargo containers. Santa Maria is the most frequently sawn timber for the local market.

Several attempts have been made to establish veneer plants in the country, but to date none has been successful. In Belmopan, a small factory supplies the local market for safety matches using pine, and steps are being taken to increase production to allow exports. With ODA assistance, the Forest Department is developing a new wood workshop to produce furniture for sale. Their pressure treatment plant, which suffers from frequent breakdowns, gives preservative treatment to pine utility poles for the local electrical network. Pine lumber belonging to private parties is also treated for a fee. In an interesting program, the Cooperative Housing Foundation has provided the Belize Agency for Rural Development, a PVO, with a portable sawmill (chainsaw mill), which is loaned with an operator to cooperative members, to produce lumber for housebuilding in rural areas from logs that have been felled for agricultural clearing and that would otherwise be unused. Livestock cooperatives are also interested in using the mill for producing fence rails and posts.

Only about five to ten percent of the annual growth of hardwood and pine timber in Belize is currently harvested. It is estimated that the annual growth of exploitable commercial timber in the country is 1.4 million m³ (309,051 mbf) for hardwoods, and 700,000 m³ (154,525 mbf) for pine. Theoretically, an amount of timber equal to the annual growth could be harvested annually, without depleting the

forest resource (principle of sustained yield). However, much of this growth is in inaccessible areas, or in areas that should receive protection for the sake of conserving biological diversity and protecting soils and watersheds. Even an arbitrary annual cut of 50% of the annual growth would involve a ten-fold increase above the current harvest level. Given the estimated current annual contribution to the government from timber royalties of B\$450,000, this increase would imply a revenue due to timber of B\$4,500,000. Currently, the value of the annual lumber production of Belize is about B\$7 million. This same increase in production would imply a value of at least B\$70 million (over one-half of the current annual national budget for the country). Other significant benefits to the Belize economy would include increased export earnings, increased rural employment and an economic reason for government protection of habitat of endangered and potentially economic forest plant and animal species.

An increase in the harvest of timber would necessitate an increase in the capacity of existing forest industries and establishment of new plants. Much of the Caribbean is a net importer of lumber, and could serve as a market for Belize timber, if sold at competitive prices and of adequate quality. Much of the current lumber used in the Caribbean is pine from the U.S and Honduras. Pine from Mountain Pine Ridge is slow-growing and dense, and should be able to help meet the increasing demand for lumber in the region. Many other low- to medium-density species could serve as a substitute for pine in Belize and the Caribbean, if sawn and dried properly, and given preservative treatment.

Imports of plywood to Belize amounted to US\$1.4 million in 1986. Many forest species of the country yield good core and/or face veneer. One or more veneer plants, and a plywood plant, could substitute for this import, and provide considerable export revenue. Increased use of wooden housing components in Belize, such as exterior and interior walls, doors, window frames, trusses and cabinets could provide a domestic market for lumber and plywood. In many cases, this increased wood use would provide a substitute for imported cement, as well. Paper and paper products imports valued US\$5.4 million in 1986. However, the large scale required for pulp mills to be cost effective, the small Belize market, and the highly competitive international market for pulp and paper products makes establishment of such an industry in the country inadvisable. Residues from sawmills, and veneer and plywood mills should be used to produce steam for the plants (for lumber and veneer drying, plywood press heat and pressure). Extra mill residues, and woods residues, could be made into charcoal for local use and export.

The forests of Belize have another significant economic importance, that being their attraction to tourists. The high proportion of the country that is still forested signifies that abundant habitat

exists for animals that are scarce in most of the rest of Central America, such as the jaguar (Felis onca), puma (F. concolor), ocelot (F. pardalis), margay (F. wiedii), tapir (Tapirus bairdii), brocket deer (Mazama americana), Morlet's crocodile (Crocodylus morleti) and many bird species, both native and migratory from North America. Plant species and forests attract tourists, as well, and tourist development has included riding trails through the forests and rafting on rivers. The protection that forests give to watersheds also subsidizes tourism, by providing clean water for sanitation and water sports. Additionally, clean rivers are important for the health of reef ecosystems and other coastal marine resources which attract tourists. Appreciable potential still exists for developing nature-related tourism in Belize. As an example, visitation of the Cockscomb Basin Jaguar Reserve has increased from 200 visitors in the first two months of 1986 to over 600 in the same period of this year. It is estimated that a trip to Cockscomb prolongs the visit of tourists in Belize by at least one day, which implies additional income for entrepreneurs in the restaurant, hotel, car rental and tourist guide business.

It is important that Belize define and classify the many forest types in the country, and protect representative areas for all of these types. This must be done to ensure the continued existence of vital habitat for conservation of biological diversity, and a source of germplasm for economic production in this and other countries.

b. The Forest Resource

As stated above, roughly 90%, or more than 20,000 km², of Belize is covered by forest vegetation, comprising 75% closed broadleaf forest, 10% mangrove and swamp, 5% woodland and pine forest, and 10% open areas and grassland. This high percentage of forested area is uncommon in Central America and the Caribbean, with the exception of Dominica and the Guianas.

Belize has approximately 4,000 species of native flowering plants, including 2,500 species of dicots and 1,500 species of monocots. About 700 species of native trees are reported for Belize, representing 331 genera in 87 botanical families.

Six major ecological "life zones" are found in Belize, e.g. Subtropical Moist Forest, Subtropical Lower Montane Moist Forest, Subtropical Lower Montane Wet Forest, Subtropical Wet Forest, Tropical Moist Forest, Transition to Subtropical and Tropical Wet Forest, Transition to Subtropical. In each life zone, edaphic and moisture conditions result in different plant associations, e.g., mangroves, pine ridge and closed broadleaf forest which are all found in the Subtropical Moist Forest life zone. Because of the generally low level of deforestation in the country to date, all of the life zones include major areas of forest. No comprehensive,

up-to-date inventory of the natural plant associations of Belize exists, however. As agricultural expansion proceeds, it is very possible that plant associations on soils of good agricultural potential (it is estimated that a relatively small proportion of land suitable for agriculture is presently being so used) in the Subtropical Moist Forest and Subtropical Wet Forest life zones will become scarce, with deleterious effects on populations of certain animal and plant species due to habitat destruction. It should be a national policy to promote more intensive agricultural development on soils of agricultural potential that have already been deforested, before allowing permits for conversion of existing forest to agriculture.

The broadleaf forests of Belize are quite heterogeneous. This has implications for natural forest management, because of the low representation of the presently marketed species in a given area. This heterogeneity is due in part to the location of Belize in Central America, and the biogeography of the North and South American fauna and flora. The biological diversity of forests of the country is high as a result, although the level of species endemism is not. However, many species are common in Belize that are decimated or rare in the rest of Central America and Mexico, because of the high proportion of Belize that remains in forest.

Small areas of forest plantations exist, mostly on public land. These include about 1,000 ha (2,471 acres) of Gmelina arborea near Mayflower, 2,000 ha (4,942 acres) of pine and 500 ha (1,235 acres) of mahogany plantations. Small plantations also exist of teak, eucalyptus and cedar. In general, however, most of these areas have been neglected and collectively they do not contribute much to Belize's forest estate or economy.

c. Forest Ownership and Institutions

Sixty-two percent (13,260.4 km²) of the forest land of Belize is in public ownership, slightly less than half of which is in 16 gazetted Forest Reserves (6,516.5 km²). The Forest Department of the Ministry of Agriculture is responsible for the management of these Forest Reserves. While much of the remaining public, or Crown, land is still forested and serves as habitat for many animal and plant species endangered elsewhere in Central America and Mexico, it is potentially available for agricultural concessions, under the authority of the Lands Department of the Ministry of Natural Resources. Private forest land (8,061.6 km²) includes some of the best remaining stands of mahogany, cedar and other timber species, in the Subtropical Moist Forest and Subtropical Wet Forest life zones.

The establishment and management of Forest Reserves is legislated in the Forest Ordinance of 1926 and its revisions. Revisions of this

legislation also affect activities on private forest lands, requiring permits, application of minimum girth limits, release of mahogany and cedar, and payment of royalties, for tree cutting on holdings over 40.5 ha (100 acres), all under the supervision of the Forest Department. Clearing of land for agriculture also requires a permit from the Forest Department, although this appears to be largely a formality under current policy. The Wildlife Protection Act of 1981 authorizes the Forest Department to control hunting on public and private land, but neither bag limits nor closed seasons exist, and lack of staff would make their enforcement impossible. The National Parks System Act of 1981 permits ministerial declaration of national parks and other protected areas. While the legislation stipulates that such protected areas are to be administered by the Chief Forest Officer, no regulations have been drawn up for implementation of the parks legislation.

The Forest Department consists of a Chief Forest Officer, a Principal Forest Officer, three Forest Officers, three Foresters, two Conservation Officers, 11 Rangers, 20 Forest Guards and support staff. Only five of these personnel have forestry degrees, while the three Foresters have received technical training. None of the personnel has received training in wildlife or parks management. The rangers staff two large and four smaller forest stations. Forest Department vehicles are old and of insufficient number for the guards to carry out their duties inspecting areas with cutting permits. Operational budgets are quite inadequate to cover the costs of gasoline and equipment purchase.

d. Management of Belize Forests

i. Forest Reserves

None of the 16 Forest Reserves has a scientific forest management plan. All of the reserves lack up-to-date inventories of the current or potential resource of timber, water, soil, wildlife, recreation or archaeology. Capability of the Forest Department staff to carry out resource inventories, develop management plans and manage forests is limited. The current role of the department is that of caretaker, rather than manager, of forest reserves. The responsibility of releasing mahogany and cedar in concessions, enforcing girth limits and measuring logs for determination of royalties takes up the majority of the time of department personnel. Staff that are assigned responsibility for a geographic area are responsible not only for carrying out these activities for concessions in the forest reserves in the area, but also on private land.

Management plans are needed for the 16 forest reserves. As part of the planning process, an inventory of timber resources needs to be made. In each reserve, areas appropriate for timber production,

watershed and wildlife protection, and recreation development should be determined. Current timber inventory, production potential of soils and accessibility will determine the suitability of an area for timber production. Areas important for community water supplies should be protected, and buffer strips should be maintained along rivers and streams. Habitat that is little represented in other areas should be identified and protected. Areas with spectacular natural beauty and archaeological significance could be developed for recreation and public education. Currently, specific areas within certain forest reserves are considered as protection areas because of their importance to watersheds or their spectacular beauty, but the legal status and permanence of these areas is uncertain. Under a British ODA forestry project now being designed, the Mountain Pine Ridge Forest Reserve will apparently be re-inventoried, and a management plan prepared. Training will also be given to Forest Department personnel. However, the emphasis of this project is apparently on industrial production.

Little information exists on the growth rates of Belize forests. Without this information, it is impossible to calculate the amount of timber that can be harvested without depleting the resource. Estimates that have been made of growth rates are very rough, and it is unclear if these estimates are for all species or only presently commercial ones. It is probable that the rate of growth, and thus the level of sustainable harvest, would be increased by more intense forest management.

Presently, few forest species are now utilized, in spite of the fact that information exists on uses, processing and management of over forty secondary species. The spotty occurrence of the few species extracted means that the economic return per unit of forest land area is quite low. Costs for entering an area are more or less fixed whether few or many species are extracted (about B\$15,000/mile road cost). This limited return from forest land contributes to the low level of priority that is attached to its management. The utilization of a greater number of timber species from forested areas would increase the economic return per unit area, the royalties collected from the area and the importance attached to these areas by the central government. Evidence from Quintana Roo in Mexico, an area of broadleaf forests similar to those of much of Belize, indicates that an increase in the number of species utilized creates more gaps in the forest, resulting in greater regeneration of commercial species.

While the Forest Department Research Unit has carried out forest management studies in the not-to-recent past, most of these studies have not been analyzed, and no results have been put into practice in recent years on forest reserves. The enforcement of girth limits, a practice initiated earlier this century, should be continued until more scientifically based and practical management

guidelines can be developed for regenerating and fostering commercial timber species. While girth limits do not assure an optimum density or growth of marketable species, they do provide a fair chance that reproductive-aged individuals of these species are represented in the stand to provide a seed source for regenerating the gaps created by felling trees, and skidding and loading logs.

The repeated logging of the forests of Belize in the last two centuries has been possible because commercial species (largely mahogany) have regenerated in areas after logging. Deliberate measures to assure regeneration of desirable species could increase their density in subsequent rotations. As an example, direct seeding of clearings opened during logging could be carried out, if no individuals of commercial species and reproductive age are within natural seed dispersal distance.

Currently, no measures are taken to affect the survival or growth of commercial species in forest stands. Thinnings to eliminate non-commercial species and give growing room to commercial ones may prove economically justifiable, especially if markets can be developed for the trees that are thinned, such as charcoal and building poles.

Several thousand acres of plantations have been established in the past by the Forest Department, as mentioned above. While most of these have not been adequately maintained, they could serve as a source of information on species adaptability to sites, growth rates and economic returns from forest plantations. The Forest Department appears to consider an increased level of forest management with the development of plantations. A careful economic evaluation should be made of the relative benefit/cost relationship of plantation and natural forest management under the different conditions of soil, moisture, markets and accessibility for the different forest reserves.

Fire control in forest reserves is of concern to the Forest Department. Past efforts at controlling fire in pine areas, such as establishment of roads for fire breaks, have resulted in large areas of good pine regeneration. While assistance is needed for continued fire protection for these areas, including trucks, radios, operating budget and training, broadleaf forest areas do not present a high risk of wildfire. The British ODA forestry project now being developed will apparently provide the needed assistance, at least for the Mountain Pine Ridge forest reserve.

ii. Other Forests on Crown Land

Specific forested areas have been set aside for protection of wildlife or outstanding scenic beauty. These include Cockscomb Basin Wildlife Sanctuary, the Halfmoon Cay Natural Monument,

Guanacaste National Park, Rio Grande Wildlife Sanctuary and Nature Reserve, Thousand Foot Falls, Caves Branch, Mountain Cow Caves, the Blue Hole and seven Crown Reserve Bird Sanctuaries. While these areas fall under the authority of the Chief Forest Officer, their management has been delegated to the Belize Audubon Society. The BAS receives funds from its members and international non-government organization such as the World Wildlife Fund-U.S., which have been used to develop management plans for some of the areas, establish facilities such as cabins and interpretive displays, and hire wardens to patrol the areas.

Other forested, non-reserved Crown lands receive virtually no forest management. Current government policy allows leasing of these lands to private parties and conversion to agriculture. If a determination of forest types finds that certain vegetative associations are not included in existing protected areas, then consideration should be given to changing the status of these areas in non-reserved Crown lands to protected areas such as national parks, wildlife sanctuaries or national monuments.

iii. Private Forests

While much of the forest area of Belize is in private holdings, almost none of this forest is managed. In many areas, timber is being extracted, presumably under the girth limit guidelines enforced by the Forest Department. Other land is just being held for speculation.

Large projects are currently underway to convert tropical forest to agriculture, such as citrus, cocoa or livestock. While a permit from the Forest Department is required for this conversion, apparently public policy makes this a routine procedure. No requirement exists for a scientific review of the capability of the soils of the area to sustain agriculture, or the availability of other land of agricultural potential that has already been deforested.

Other private forests are converted to agriculture by small farmers, under the milpa system. The principal areas of this activity are in the Toledo District, where expanding Indian populations require new lands to farm, and in areas settled by refugees from other Central American countries. Milpa farming is largely a subsistence endeavor. When adequate land is available, this system is a sustainable land use, as plots are cropped for two or three years, then left for eight to twelve years to allow soil conditions to improve through the accumulation of organic matter and domination of weeds by bush fallow vegetation. However, as populations increase, fallow periods are shortened and soil is degraded, or new areas are converted from forest to agriculture. Modifications of the milpa system are possible that can increase productivity and

sustainability of the system, even under increasing land pressure. Agroforestry, the combination of crops with trees, and permanent tree crops such as cocoa and fruit trees, offer alternative technologies that can be easily adapted to the socio-economic conditions of the milpa farmer. Promotion of these new technologies should emphasize increased productivity for the milpa farmer, and his gradual integration into the rural economy of Belize. Products from trees associated with crops can be used on the farm as well as marketed in the local area.

2. Tropical Forest Conservation Needs for Belize

- a. The contribution of Belize forests to the national economy needs to be increased.
 - i. Utilization of a larger number of timber species needs to be achieved. Appropriate technologies are known for utilizing secondary species, and should be transferred to entrepreneurs.
 - ii. Policy dialogue should be undertaken to promote greater use of trees in timber concessions and in areas cleared for agriculture.
 - iii. Value should be added to timber species before export by manufacturing furniture, decorative plywood and other products.
 - iv. Royalties collected from timber should go directly to the Forest Department budget.
 - v. Assistance in managing forests should be provided to private landholders.
- b. A comprehensive National Forestry Development Plan should be developed by the GOB.
 - i. Policy dialogue is needed to gain GOB political support for the development and implementation of a forestry development plan, as part of the national development strategy.
 - ii. A Forestry Sector review, implemented under the auspices of the FAO Tropical Forestry Action Plan, should be carried out for Belize. Major components of a FSR are 1) agroforestry and watershed management, 2) forest-based industrial development, 3) fuelwood and energy, 4) conservation of forest ecosystems and f) forestry institutions. An action

plan would identify complementary projects for international development investment.

- iii. Financial and policy support by the international donor community in Belize is needed for a forestry development plan.
- c. Management plans for established Forest Reserves need to be developed and implemented.
 - i. The Forest Department needs to adopt a policy of managing its forests for multiple uses.
 - ii. Training is needed in inventory, and development and implementation of forest management plans.
 - iii. Inventories are needed for the 16 forest reserves. For this, up-to-date aerial photos are crucial.
 - iv. Management plans for each forest reserve need to be developed, identifying areas for production of timber, water and wildlife, protection and recreation.
 - v. Implementation of management plans is needed. This requires adequate budgets and trained staff.
- d. Representative areas of all natural vegetation types in Belize need to be protected, in order to assure the conservation of biological diversity.
 - i. Policy dialogue is required to encourage GOB support for protection of representative natural areas. The role of such areas in attracting tourists should be emphasized.
 - ii. A determination is needed of the different natural vegetative associations in Belize.
 - iii. Existing protected areas should be evaluated to identify what natural forest types they include.
 - iv. Candidate areas for protection need to be identified that include vegetation types not included in other protected areas.
 - v. Management plans need to be prepared and implemented for protected natural areas. This includes training of staff and allocation of adequate budgets for management.

- e. Management of private sector forests needs to be promoted and increased.
 - i. Technical assistance should be provided to landholders in management of their forests. This might be provided by a Forest Department Extension Unit. Long-term contracts between forest industry and landholders could include management assistance as an alternative.
 - ii. Permits for conversion of land from forest to agriculture should only be given after a scientific determination of the capability of the land to support sustained agriculture. Availability of alternative land should also be determined.
 - iii. Incentives for forest management on private lands, such as tax incentives, should be considered.
 - iv. Information on the benefit/cost relationship of sustained forest management is needed, and should be passed on to private landholders.
- f. Agroforestry and other technologies to sustain production on milpa farms is needed.
 - i. A mechanism for introducing and adapting agroforestry and tree crop technologies on milpa farms is needed. This should be developed and implemented through existing community organizations.
 - ii. Markets need to be developed for products of agroforestry systems from milpa farms.
 - iii. Cost/benefit information of agroforestry systems on milpa farms is needed.

3. AID Participation

a. Previous and on-going Projects and Activities

- i. USAID/Belize funded the Belize Country Environmental Profile, which included forestry in its analysis of natural resources and environmental issues.
- ii. USAID/Washington funded financial, marketing, technical and preliminary environmental analysis by Coopers & Lybrand Consultants of expanded logging

and sawmilling activities by Belize Timber, Ltd in 1983.

- iii. The Accelerated Cocoa Production project (505-0023) promotes cocoa production, an agroforestry activity that can relieve pressure on tropical forests by providing a productive stable alternative to milpa farming.
- iv. USAID/Washington funded travel and attendance of the Chief Forest Officer of the Forest Department at the 1985 International Seminar on Forest Resources Administration and Management, organized by the University of Michigan.

b. Possible Future USAID/Belize Activities

British/ODA programming is currently being designed to promote management and utilization of the Mountain Pine Ridge Forest Reserve. Proposed USAID programming will be coordinated with these activities.

- i. Policy dialogue with the GOB will encourage recognition of the economic potential of Belize forests for production of export goods, import substitution and tourism.
- ii. Mission assistance will be given to the GOB for development of a National Forestry Development Plan, through the Forestry Sector Review process. This activity will be undertaken as part of the FAO Tropical Forestry Action Plan, hopefully with assistance from the British government, given their current interest in the Belize forestry sector.
- iii. The mission will promote an increase in the contribution of forests to the economy, by increasing the use of secondary species from public and private forests. This will be done through policy dialogue and funding of studies for appropriate forest technology pilot plants.
- iv. Technical assistance will be provided to the Forest Department for the preparation and implementation of management plans for forest reserves.
- v. Training will be provided to the Forest Department in wildlife and protected area management, to strengthen the capability of the department to manage areas that attract nature-related tourism.

B. Biological Diversity

Biological diversity refers to all living things and the ecological systems they form. It includes all species of wild plants and animals, the genetic variation within each species and the variety and complexity of the habitats and ecosystems that support these species.

Biologists estimate that there are at least 10,000,000 species of plants and animals in existence today. Fully 5 to 20 percent (500,000 - 2,000,000) of these species are thought to be vulnerable to extinction over the next 20 to 50 years, due to the continued loss and alteration of natural habitats, especially tropical forests (CEQ, 1980, The Global 2000 Report to the President)

Such a reduction in the variety of living resources is cause for serious concern for several reasons. First, valuable germplasm resources from wild relatives of currently utilized species may be lost at a time when genetic improvement is gaining increased attention. Second, many wild species that hold great commercial promise for new foods, new medicines or new industrial raw materials could be lost. Third, a major reduction in natural diversity may also impair crucial ecosystem services such as soil formation and retention, nutrient cycling and watershed protection.

Although each country presents its own particular circumstances, effectively conserving biological diversity resources in any country will require appropriate authorities for the protection of natural habitat and wild plant and animal populations, a representative protected area system, and wildlife and plant management programs capable of inventorying, monitoring, and, when necessary, managing wild plant and animal populations both on and off protected areas. Effective conservation programs will also require the necessary institutional capacity to develop an adequate information base on wild living resources, and to undertake appropriate research.

The following is an analysis of the current conservation situation in Belize. This analysis examines protected areas, wildlife, fisheries and plant conservation programs, and the existing conservation information base for the country.

1. Biological Diversity in Belize

A complete inventory of species indigenous to Belize is not available. However, Belize's tropical and subtropical climate and its location in Central America where elements of the North and South American floras and faunas have mingled within the last 2 million years has provided a high level of species diversity in a

country roughly the size of Massachusetts. As noted earlier, Belize has some 4000 species of flowering plants and an unknown number of lower plants. The fauna includes a known total of 121 mammal, 504 bird, 107 reptile, and 63 freshwater fish species. There is an unknown but undoubtedly rich assemblage of marine fish, and of invertebrates, both terrestrial, freshwater and marine.

No detailed habitat classification is available, but Wright et al. (as cited in the Belize Country Environmental Profile) defined 34 natural vegetation types. No classification or enumeration of marine habitats is available, but Belize's extensive barrier reef system and associated cays, lagoons and estuarine areas, once studied, are likely to reveal a high diversity of aquatic habitats, both marine and coastal.

A good general description of the natural resources, including fauna and flora, of Belize may be found in the Belize Country Environmental Profile (Robert Nicolait and Associates, 1984, Belize Country Environmental Profile; hereafter referenced as BCEP).

2. Current Conservation Programs

a. Laws, Authorities and Treaties

The Forest Ordinance provides the GOB with legal authority to declare forest reserves. The National Parks System Act of 1981 provides the GOB the legal authority to establish national parks, nature reserves, wildlife sanctuaries and natural monuments. Authority for the protection of wildlife in Belize stems from a 1944 ordinance and legislation passed in 1945, as updated in the Wildlife Protection Act of 1982. Authority for the protection and management of fisheries stems from the 1977 Fisheries Ordinance (BCEP). The Forest Department has the administrative responsibility for the public forests, national parks and other protected areas, and for wildlife management. The Fishery Department has the administrative responsibility for implementation of Belize's fisheries laws and regulations.

Belize is not a party to any of the major international habitat or wildlife conservation conventions (e.g., The World Heritage Convention, The Convention on Protection of Wetlands of International Importance, The Convention on International Trade in Endangered Species, or UNESCO's MAB Biosphere Reserve Program).

b. Habitat Conservation Programs

i. Public Lands

As of 1984, the GOB held title to more than 50% of the country (13,260 km²). Of this public estate, some 6743 km² were

unreserved forest lands and 6517 km² were within 16 officially declared forest reserves. The marine continental shelf and the majority of offshore cays are also in the public domain. An existing ordinance reserves to the government one chain (20m) of ocean water frontage as public land. However, a good deal of coastal frontage was privately titled before passage of this ordinance and many of the larger and more attractive cays are also privately owned, in whole or in part (BCEP).

ii. Protected Areas

There are currently 12 existing conservation areas in Belize. These include Belize's first national park, Hol Chan (a marine area), the recently created Cockscomb Wildlife Sanctuary, Half-Moon Cay Natural Monument, Guanacaste Park, Rio Grande Wildlife Sanctuary and Nature Reserve and 7 Crown Reserve Bird Sanctuaries. Most of these areas (other than Hol Chan, Cockscomb and Rio Grande) are quite small. The GOB is also protecting 4 small scenic areas (Thousand Foot Falls, Caves Branch, Mountain Cow Caves and Blue Hole). However these four areas are of uncertain legal and administrative status. Although roughly 22% of the 6517 sq km of designated forest reserves is unofficially recognized as "protection forest" and an additional 33% is considered inaccessible, none of the existing forest reserves appear to be under a formal management plan and it is unclear to what extent these lands will contribute, over the long term, to the systematic conservation of biologic l diversity in Belize. Also, many of the forest reserves (e.g., Freshwater Creek and Silkgrass) have been partially converted to other land uses and in some cases parts of the forest reserves have been officially declassified and sold to private interests or ceded to milpa farmers.

In addition to the public areas discussed above, there are two private nature reserves in Belize: the Bermudian Landing Howler Monkey Reserve and the Shipstern Lagoon Wilderness Project. The latter is a large (22,000 ac) area intended as a for-profit butterfly farming operation in Northeastern Belize.

Some 15 potential reserve sites have been identified by the Belize Audubon Society (BAS) and/or others and are discussed briefly in the BCEP. These include the proposed designation of Belize's barrier reef and associated cays, reefs and lagoons as a World Heritage Site. Another 15 sites have been identified by Scott and Carbonell (1986, A Directory of Neotropical Wetlands, IUCN) as potentially eligible for designation under the Convention on the Protection of Wetlands of International Importance, Especially as Waterfowl Habitat (the RAMSAR convention), should Belize choose to join that convention.

iii. Habitat Classification System

There is only one detailed classification of natural vegetation available for Belize (Wright et al. 1959 as cited in the BCEP). However, this classification is somewhat outdated and may contain errors in extrapolation of certain data (BCEP). There have also been considerable land use changes in some areas of the country since the late 1950s. Recently, the Toledo district has been resurveyed along the lines of the 1959 surveys and it is hoped that the rest of the country will also be resurveyed in the near future. Nevertheless, the 1959 study and its companion map of vegetation types can serve as a useful first approximation for purposes of assessing major natural habitat types on a scale useful for land use and conservation planning.

On a broader scale, Hartshorn (BCEP) recognizes 6 ecological life zones for Belize (4 subtropical and 2 tropical) based on the Holdridge life zone system. However, the scale of this classification is far too coarse to adequately define the full spectrum of natural habitats and community types in the country.

In addition to the above classifications, the recently completed inventory of wetlands noted above identifies sites of exceptional importance, particularly as waterfowl habitat (Scott and Carbonell, op. cit.). Further work on identifying high priority wetlands is underway by BAS and the Massachusetts Audubon Society.

iv. Habitat Conservation Needs

Belize is the second smallest but least populated country in Central America. With a population of roughly 170,000, over half of which is clustered in towns of 2000 or more people, much of the country is only sparsely populated (BCEP). Although 93% of Belize is nominally classified as forest land, this figure does not accurately reflect current land use (BCEP). With its small population, modest agricultural sector, and history of selective logging, deforestation is not yet a severe problem in Belize (BCEP). Unfortunately, beyond forested areas, there is little information on current or potential rates of habitat conversion. The GOB, aid agencies and the private sector are exploring various scenarios to expand agriculture, livestock and forest sector development which could substantially accelerate habitat conversion over the next decade. There is no clear policy of sustainable forest management in Belize because national policies and management plans for the GOB's forest reserves have not been fully developed. Consequently, it is difficult to assess either the rate or impact of further forest or other habitat conversion.

Adequately conserving biological diversity in Belize will require protection of viable examples of the full array of natural habitat types in the country. Belize has a large public land base, but it currently has only a small and undeveloped protected area system.

Although a number of potential protected areas have been identified and all seem to have conservation merit, it is difficult to adequately assess priorities among these recommendations, or if other sites should be considered, without first having a systematic analysis of the coverage of habitat types within existing protected areas and without comprehensive master plans for existing forest reserves that establishes how those areas will be managed. Consequently, a protected areas systems review or "gaps analysis" is a critical need for conservation in Belize at this time. Such a gaps analysis has been actively discussed in the private conservation community, but to date, no useful surveys or analyses have been done.

From the perspective of long-term, systematic conservation of Belize's biological diversity, habitat conservation needs in Belize have two principal components. First, it is very likely that many natural habitat types are not yet represented in the current protected areas system. Some additional protected areas will likely be needed. Determining an adequate protected areas system for the country hinges critically on analyzing where there are gaps in the current protected areas system as discussed above and on the establishment of a comprehensive national forest policy and development of management plans for the country's forest reserves.

Second, it is clear that adequate management of currently designated protected areas suffers from a severe shortage of personnel, planning, and operational funds. For example, although authority for the management of national parks, nature reserves, wildlife sanctuaries and natural monuments resides with the Forest Department, actual management of most of these areas has been delegated by the Department to the BAS, a local nongovernmental conservation organization. BAS is, in turn, supported in large measure by U.S. and international conservation NGOs. As another example, the Belize Forest Department has only 5 professional foresters to manage a national forest estate of over 13,000 km².

Development of a sound public lands/natural resources planning and management capability for the rational allocation of conservation and development efforts on the public estate and the institutional strengthening of the Forest Department to develop a real management capability are major needs at this time.

c. Wildlife and Fisheries Conservation Programs

i. Protected/Endangered Species

The Wildlife Protection Act of 1981 protects all undomesticated mammals, birds and reptiles from unregulated taking. Certain species are listed and protected from all taking. Other species may

only be taken by licensed hunters during seasons and in such quantities as established by the Forest Department. The take of fish and certain other marine taxa (e.g., turtles) is regulated under the Fisheries Ordinance of 1977. It is not clear if there is any legal authority for the protection and management of wild plants, amphibians, or freshwater fish. Belize has no formal endangered species regulations; however, the species completely protected by the Wildlife Protection Act are those once listed by the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) as threatened or endangered. The BCEP gives brief accounts of 24 vertebrate species (15 mammals, 2 birds, 7 reptiles) that occur in Belize and are listed by CITES. The BCEP also lists and discusses 22 bird species occurring in Belize that are listed by the International Council for Bird Preservation (ICBP) as endangered.

A more recent compilation of endangered and threatened species (IIED/WRI, 1987, World Resources 1987) includes 18 mammal, 69 bird and 12 reptile species for Belize. These figures mean that roughly 15% of the mammal, 14% of the bird, and 11% of the reptile species currently known from Belize are either threatened or endangered by some standard. However, it should be noted that these listings are often based on the status of a species from areas other than Belize. Several of the species listed by some authorities as threatened or endangered overall may actually be relatively abundant in Belize at present (e.g., jaguar; BCEP).

ii. Hunting, Commercial Trade and Fisheries

Although both wildlife and fisheries authorities appear adequate in most regards, existing regulations are not complied with due to a lack of enforcement capability. Both rural and urban sportsmen appear to ignore hunting regulations and certain fisheries stocks are showing signs of decline despite regulations established to protect them (BCEP). This lack of enforcement capability is particularly true with regards to wildlife. The lack of enforcement capability stems clearly from an insufficient number of staff, equipment, operational funds and management program revenues. For example, as of 1987, the Forest Department had no professional wildlife biologists on staff and only 2 staff in the Department whose duties include wildlife management among other responsibilities.

The Wildlife Protection Act of 1982 included a 7 year moratorium on commercial trade in wildlife. The country appears to have been successful in suspending virtually all trade in wildlife, and, although some smuggling undoubtedly occurs, several formerly depleted species seem to be recovering (e.g., Morelet's crocodile; BCEP). However the current situation does little to build a strong sporting or commercial constituency within the government or private

sector for enhancing wildlife conservation programs. There is no a priori biological reason to exclude a sustainable sport hunting or commercial wildlife trade in Belize. The only constraints are the initial investment in staff, equipment and operational costs necessary to adequately inventory, monitor and manage a sustainable sport harvest and/or wildlife trade.

iii. Wildlife and Fisheries Conservation Needs

Neither habitat conversion nor commercial trade appear to be severe short-term threats to wild plant and animal resources in Belize. The effect of current hunting is unknown. Commercial fishing is beginning to show signs of depletion of several near-shore stocks (conch and lobster; BCEP). As with habitat protection programs, the most serious need for wildlife, fisheries and plant conservation is the strengthening of the relevant management authorities (Forest Department, Fishery Department) to effectively implement and enforce existing regulations and to undertake the inventory, monitoring and research to assure that regulations are, in fact, adequate. As a minimum, a fisheries enforcement unit should be established within the Fishery Department and the Forest Department should hire one full-time professional wildlife biologist.

d. Conservation Information Base

i. Overview Documents

USAID sponsored a country environmental profile for Belize in 1984 (BCEP). Much of this analysis is derived from the information in that document. Although a national conservation strategy for Belize was discussed during 1982-84, the status of such an effort remains unclear at present. A forestry sector review, along the lines of those being conducted in more than 20 countries under the auspices of the Tropical Forestry Action Plan, would be an extremely useful point of policy dialogue and development assistance project planning for both tropical forest management and biological diversity conservation at this stage. Forest ecosystem conservation, (and the biological diversity resources they contain) is one of the five primary areas being addressed in these national forestry sector reviews.

ii. Literature

Although the literature on wildlife, vegetation and forests of Belize is substantial (over 200 references), the lack of information and locality data from which to make good conservation decisions is serious when compared with the information base in other countries of Latin America and the Caribbean (Burley, pers. comm.).

Several individuals and organizations (e.g., BAS and the Belize Environment Center) have gathered much of this information and many of the references, but to date, no attempt has been made to systematically analyze this information for determining conservation priorities.

iii. Institutions

Belize has a very recently established zoo (private), but no museum, herbarium, botanical garden or other institution which might logically serve as a focus for building a conservation information base. Belize also lacks a four-year degree granting college or university and, consequently no local educational or training programs in such disciplines as taxonomy, ecology, conservation biology, wildlife or fisheries management. Long term or advanced training in such disciplines would have to be undertaken overseas. This lack of local institutions and a diffuse literature makes development of a conservation data center along the lines of those being initiated in other Latin American and Caribbean countries a logical means of addressing a current key conservation need for an adequate information base.

e. Private Sector Programs

The major burden of conservation work in Belize has been undertaken by the private conservation sector, namely BAS with major support from international and U.S. conservation NGOs (World Wildlife Fund - U.S. and International, New York Zoological Society, the Massachusetts Audubon Society, and others). Recently, complementary efforts have come from the privately operated Belize Zoo, with support from both local and international sources. These efforts include a very active public awareness program on nature conservation that features a mobile van bringing short programs to public schools throughout the country, a poster series and a zoo newsletter. In addition, several private protected areas have been or are being developed - the Bermudian Landing Howler Monkey Reserve and the Shipstern Lagoon Wilderness Project. As a result there is a strong and active indigenous conservation community drawing substantial support from outside sources. This is a very positive situation and, given the history of collaboration between BAS and the Forest Department on management of existing protected areas, there appears to be the foundation for an effective public/private coordination of conservation activities and allocation of resources. However, the private sector cannot be expected to carry the entire burden and a major issue for the GOB is how to expand their conservation initiatives in the current restricted fiscal climate.

3. Economic Potential of Protected Areas and Wildlife

No studies, assessments or data on the current or potential overall economic value of protected areas or wildlife to the Belize economy have been identified. A recent feasibility study of a private game ranching operation is available (Berwick pers. comm.) The Ministry of Tourism is sponsoring an assessment of the international tourism sector in Belize, and efforts will be made to review this information for the first future revision of this analysis. Nevertheless, as of 1984, both tourism and fisheries ranked in the top four sectors as earners of foreign exchange (BCEP). Belize has tremendous tourism potential, especially in the fast growing natural history/educational tourism areas, much of which is related to outstanding natural and cultural features such as Belize's barrier reef, Mayan ruins, and primary tropical forests and wildlife. Although expansion of this potential faces certain constraints, the benefits in terms of jobs, foreign exchange and awareness of Belize should make this a priority area for development assistance investment. Keys to unlocking this potential include better marketing of Belize to the international tourism industry, better access to certain areas, and expanded and improved services and accommodations. Also crucial will be improved infrastructure (e.g., available and reliable electricity), and enhanced management and interpretation of the natural and cultural protected areas that will increasingly be a major feature of Belize's tourism industry. USAID and/or other development assistance agencies could play a catalytic role in this area by sponsoring a natural/cultural tourism assessment that would focus on the above factors and examine the issue of how the industry and government might work together and make complementary investments to realize the economic potential of this tourism sector. A well planned and successful expansion of this type of tourism could substantially augment revenues that could be used for the long-term management of Belize's natural and cultural resources.

Fisheries is another major economic sector based on a potentially renewable resource base that will require increased efforts at rational management to ensure long-term continuity of benefits. Strengthening the Fishery Department to provide a much needed regulatory capability is necessary to ensure a productive fisheries sector well into the future.

As noted earlier, there is apparently little information upon which to base an assessment of the potential for cropping wild game for sport or commerce, and hence the economic potential this might involve is unknown. There are no efforts underway in this area despite the fact that the current moratorium on commercial trade in wild species was intended to allow time for such an assessment. Experience in other countries would indicate that there may be substantial economic potential for Belize through well managed sport and commercial harvests of carefully selected wild species. An assessment of this potential is a longer term need.

4. Biological Diversity Conservation Needs

Belize currently has adequate legislated authorities for the protection of natural habitats, public forests and wildlife and fisheries resources. The GOB also has a substantial public lands base and some significant established protected areas. There is an active and capable private conservation community with established ties to international organizations and funding sources. Despite this, little has been achieved to date to ensure the systematic conservation of Belize's biological diversity or the long-term sustainable management of its large forest estate.

This analysis has identified a number of key needs that must be met if the potential for systematic conservation of biological diversity and rational development of the public estate are to be fulfilled. These are:

1. Establishment of a public lands and land development policy to guide the development and management of Belize's natural resources. This policy should specifically address the conservation of biological diversity and the long-term sustainable management of tropical forests in Belize.
2. A comprehensive and systematic review of life zones, vegetation types, natural habitats and the distribution of selected wildlife species on protected areas and public lands and waters (including forest reserves) to determine areas in Belize that should be considered for some form of conservation management.
3. Establishment of a land use/natural resources planning unit within the Forest Department to implement the above recommendations and to develop management plans for the nation's forest reserves, national parks, natural monuments, wildlife sanctuaries, nature reserves and other lands and waters.
4. Expansion of the Forest Department staff to add at least one trained wildlife biologist and one trained protected area specialist with possible designation of a separate branch (e.g., parks and wildlife) within the Forest Department or elsewhere within the Ministry of Agriculture. These staff could initially be the core of the planning unit mentioned above with longer-term duties emphasizing implementation of plans, once developed.
5. Establishment within the Fishery Department of a regulation enforcement branch to implement existing fisheries laws and regulations.

6. A thorough assessment of the economic potential and development requirements for natural history and culturally based tourism focused on Belize's protected areas.

Longer-term needs will include adequate staffing and operational funds for the implementation of protected areas management plans and a wildlife management program; an assessment of the economic potential and development requirements for sport hunting and commercial wildlife trade; and Belize's participation in the major international conservation conventions and programs (CITES, RAMSAR, World Heritage Convention and the Biosphere Reserve Program).

5. AID Participation

The USAID/Belize CDSS (1984) establishes the goals of the U.S. foreign assistance program in Belize and lays out the strategies, benchmarks, timing and means of achievement of these goals. The overall goals of the program are to address the constraints to economic growth and development by focusing on economic stabilization, agricultural diversification, export promotion, infrastructure development and selected types of human resources development. Consequently, the current Mission portfolio includes major attention to the areas of budgetary support, agricultural and livestock development, rural road and bridge improvement, expansion of electricity generating capacity, export promotion, public health programs and training.

Given these areas of emphasis and current fiscal constraints, overall activity in the natural resources sector has not been an area of emphasis. However, the Mission has helped sponsor development of a country environmental profile (BCEP). Excess copies of the BCEP were donated to BAS for resale. The Mission is also collaborating with the Bureau for Latin America and the Caribbean in providing \$60,000 to the GOB to develop a management plan for the new Hol Chan National Park. Further action to meet the needs identified in this analysis would, for the most part, require supplementing the current Mission budget or Regional Bureau funding. However, some action could be incorporated through application of existing programs. For example, ESF support conditionalities could include dialogue with the GOB on establishment of a public lands policy and development of a land use/natural resource planning capability. Other major points that should be included under such dialogue include establishment of a fishery compliance unit and creation of at least two positions within the Forest Department for a full time wildlife biologist and protected area specialist to begin implementation of existing habitat and wildlife authorities and regulations. Other avenues, such as use of PD&S funds and the CAPS or other training programs to meet selected needs for studies and training should be considered.

TROPICAL FORESTS / BIOLOGICAL DIVERSITY

PD-AAZ-835

: ANNEX TO USAID / BELIZE FY 89-90

1 OF 1 (24X)

BELIZE

1988

ACTION PLAN